

In the Claims

Please amend Claims 4, 5, 14, 19, 31, and 33. Amendments to the claims are indicated in the attached "Marked Up Version of Amendments" (pages i-iv).

4. (Twice Amended) A phase shifter circuit for imparting a phase shift to an input signal applied at an input port such that a phase shifted signal appears at an output port, the circuit comprising:
- an input port coupled to receive the input signal;
 - an output port coupled to provide the phase shifted output signal, the output port coupled to the input port by coupled lines, such coupling between the input port and output port having a characteristic input/output impedance;
 - a first quadrature port and a second quadrature port, the first and second quadrature ports coupled to one another, such coupling between quadrature ports having a characteristic quadrature port impedance, being different from the input/output port impedance;
 - a first impedance transformer coupled between the input port and a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input/output ports to the characteristic quadrature port impedance across the quadrature ports; and
 - a second impedance transformer coupled between a second one of the quadrature ports and the output port, the second impedance transformer transforming the characteristic quadrature port impedance across the quadrature ports to the characteristic input/output impedance.
5. (Amended) A phase shifter circuit for imparting a phase shift to an input signal applied at an input port such that a phase shifted signal appears at an output port, the circuit comprising:
- an input port coupled to receive the input signal;

an output port coupled to provide the phase shifted output signal, the output port coupled to the input port, such coupling between the input port and output port having a characteristic input/output impedance;

a first quadrature port and a second quadrature port, the first and second quadrature ports coupled to one another by coupled lines, such coupling between quadrature ports having a characteristic quadrature port impedance, being different from the input/output port impedance;

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a first impedance transformer coupled between the input port and a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input/output ports to the characteristic quadrature port impedance across the quadrature ports; and

a second impedance transformer coupled between a second one of the quadrature ports and the output port, the second impedance transformer transforming the characteristic quadrature port impedance across the quadrature ports to the characteristic input/output impedance.

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14. (Amended) An apparatus as in Claim 1 wherein a Radio Frequency (RF) choke is applied between a bias voltage port and one of the quadrature ports.
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19. (Amended) A method for imparting a phase shift to an input signal applied at an input port such that a phase shifted signal appears at an output port, the method comprising the steps of:

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receiving the input signal at an input port;

providing the phase shifted output signal at an output port, the output port coupled to the input port by coupled lines, such coupling between the input port and output port having a characteristic input/output impedance;

coupling a first quadrature port to a second quadrature port, such coupling between quadrature ports having a characteristic quadrature port impedance, being different from the input/output port impedance;

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coupling a first impedance transformer between the input port and a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input/output ports to the characteristic quadrature port impedance across the quadrature ports; and

coupling a second impedance transformer between a second one of the quadrature ports and the output port, the second impedance transformer transforming the characteristic quadrature port impedance across the quadrature ports to the characteristic input/output impedance.

31. (Amended) A method for imparting a phase shift to an input signal applied at an input port such that a phase shifted signal appears at an output port, the method comprising the steps of:

receiving the input signal at an input port;

providing the phase shifted output signal at an output port, the output port coupled to the input port, such coupling between the input port and output port having a characteristic input/output impedance;

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coupling a first quadrature port to a second quadrature port, such coupling between quadrature ports having a characteristic quadrature port impedance, being different from the input/output port impedance;

coupling a first impedance transformer between the input port and a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input/output ports to the characteristic quadrature port impedance across the quadrature ports;

coupling a second impedance transformer between a second one of the quadrature ports and the output port, the second impedance transformer transforming the characteristic quadrature port impedance across the quadrature ports to the characteristic input/output impedance; and

applying a Radio Frequency (RF) choke between a bias voltage port and one of the quadrature ports.

33. (Amended) A phase shifter circuit for imparting a phase shift to an input signal applied at an input port such that a phase shifted signal appears at an output port, the circuit comprising:
- an input port coupled to receive the input signal;
 - an output port coupled to provide the phase shifted output signal, the output port coupled to the input port, such coupling between the input port and output port having a characteristic input/output impedance;
 - a first quadrature port and a second quadrature port, the first and second quadrature ports coupled to one another, such coupling between quadrature ports having a characteristic quadrature port impedance, being different from the input/output port impedance;
 - a first impedance transformer coupled between the input port and a first one of the quadrature ports, the first impedance transformer transforming the characteristic input/output impedance across the input/output ports to the characteristic quadrature port impedance across the quadrature ports;
 - a second impedance transformer coupled between a second one of the quadrature ports and the output port, the second impedance transformer transforming the characteristic quadrature port impedance across the quadrature ports to the characteristic input/output impedance; and
 - at least one varactor diode is coupled to at least one quadrature port, wherein an input bias voltage is applied to at least one of the varactor diodes.

REMARKS

Claims 1-34 are pending in the application. Applicant respectfully requests entry of the foregoing amendment to claims 4, 5, 14, 19, 31, and 33 prior to further examination.

Allowable Subject Matter

The Applicant thanks the Examiner for the indication of allowable subject matter.

The Examiner stated that claims 4, 5, 14, 19, 31, and 33 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.